

Industrial Safety & Hazard Analysis

HEALTH HAZARDS AND LEGAL ASPECTS

1. OCCUPATIONAL HEALTH HAZARDS

Occupational health hazards are hazards of exposure to pollution, noise and vibrations in the working environment. Occupational illness normally develops over a period of time because of workplace conditions. Such conditions might include exposure to disease-causing bacteria and viruses, or to chemicals or dust.

Under the Occupational Health and Safety Act, occupational illness is defined as a condition that results from exposure in a workplace to a physical, chemical or biological agent to the extent that the normal physiological mechanisms are affected and the health of the worker is impaired. Occupational Health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs.

2. OSHA

The Occupational Safety and Health Administration (OSHA) is an agency of the [United States Department of Labor](#). OSHA officially formed on April 28, 1971, the date that the OSH Act became effective. OSHA has a number of training, compliance assistance, and health and safety recognition programs throughout its history.

Responsibilities under OSHA Law

Employers have the responsibility to provide a safe workplace.

By law, employers must provide their workers with a workplace that does not have serious hazards and must follow all OSHA safety and health standards. Employers must find and correct safety and health problems. OSHA further requires that employers must first try to eliminate or reduce hazards by making feasible changes in working conditions rather than relying on personal protective equipment such as masks, gloves, or earplugs. Switching to safer chemicals, enclosing processes to trap harmful fumes, or using ventilation systems to clean the air are examples of effective ways to eliminate or reduce risks.

Employers must also

- Inform workers about chemical hazards through training, labels, alarms, color-coded systems, chemical information sheets and other methods.
- Provide safety training to workers in a language and vocabulary they can understand.
- Keep accurate records of work-related injuries and illnesses.
- Perform tests in the workplace, such as air sampling, required by some OSHA standards.
- Provide required personal protective equipment at no cost to workers. (Employers must pay for most types of required personal protective equipment.)
- Provide hearing exams or other medical tests when required by OSHA standards.
- Post OSHA citations and annually post injury and illness summary data where workers can see them.
- Prominently display the official OSHA Job Safety and Health - It's the Law poster

that describes rights and responsibilities under the OSH Act.

- Not retaliate or discriminate against workers for using their rights under the law, including their right to report a work-related injury or illness.

Workers have the right to

- Working conditions that do not pose a risk of serious harm.
- File a confidential complaint with OSHA to have their workplace inspected.
- Receive information and training about hazards, methods to prevent harm, and the OSHA standards that apply to their workplace. The training must be done in a language and vocabulary workers can understand.
- Receive copies of records of work-related injuries and illnesses that occur in their workplace.
- Receive copies of the results from tests and monitoring done to find and measure hazards in their workplace.
- Receive copies of their workplace medical records.
- Participate in an OSHA inspection and speak in private with the inspector.
- File a complaint with OSHA if they have been retaliated or discriminated against by their employer as the result of requesting an inspection or using any of their other rights under the OSH Act.
- File a complaint if punished or retaliated against for acting as a "whistleblower" under the 21 additional federal laws for which OSHA has jurisdiction.

SAFE WORKING ENVIRONMENT

1. Entry and exit

Workers must be able to safely enter and leave the workplace. This may include making sure that any workers with special needs or disabilities can safely enter and exit.

2. Housekeeping

Keeping the workplace clean and tidy can minimise injuries resulting from slips and trips. This includes providing sufficient space for storage.

3. Work areas

There should be sufficient clear space between furniture, fixtures and fittings so that the workers can move about freely without strain or injury, and can also evacuate quickly in case of an emergency.

4. Floors and other surfaces

Floor surfaces should be suitable for the work area. The type of floor surfaces or coverings (e.g. carpet) in use will depend on the type of work carried out as well as materials used during the work process.

Floors should be inspected regularly and maintained to eliminate slip and trip hazards.

Common examples of hazards include trailing cables, uneven edges or broken surfaces, gratings or covers, loose mats or carpet tiles.

5. Workstations

Workstations should be designed so that the workers can carry out their work in a comfortable, upright position. It is best to provide adjustable workstations to make the work height suitable for the person and the task. Seating should provide good body and foot support (especially for the lower back) and allow adequate space for leg clearance and freedom of movement.

6. Lighting

Sufficient lighting (natural or artificial) to allow safe movement around the workplace and for the workers to perform their work without having to strain their eyes. Emergency lighting for the safe evacuation of people in the event of an emergency.

7. Air quality

Workplace should be adequately ventilated with fresh, clean air. Workplaces may have natural ventilation, mechanical ventilation (fans or extraction units) or air-conditioning. Natural ventilation should consist of permanent openings, including windows and doors, and may be assisted by mechanical ventilation.

Air-conditioning and other ventilation systems should be regularly serviced and maintained in accordance with the manufacturer's instructions.

Work processes that release harmful substances should have specific controls to extract these at the source e.g. local exhaust ventilation.

8. Heat and cold

Workers must be able to carry out work in extreme heat or cold without a risk to their health and safety, so far as is reasonably practicable. Comfortable temperature for the workers with the use of air-conditioning, fans, electric heating and open windows, and by controlling airflow and the source of drafts.

9. Welfare facilities

Workers with access to adequate welfare facilities, including

- clean drinking water
- clean toilets
- Hand washing facilities.
- hygienic dining facilities
- accessible and secure personal storage
- Showering facilities.

10. Remote or isolated work

Isolated work means work that is isolated from the assistance of other people - including rescue, medical assistance and emergency services - because of the location, time or nature of the work being done.

Identify and manage the risks associated with any remote or isolated work. Risk means anything that may cause harm to workers or other people at your workplace.

This will involve

- identifying any problems (known as hazard identification) - exposure to violence and poor
- access to emergency assistance are the main hazards that increase the risk of remote or isolated work
- making an assessment of the risks (determining how serious the problems is)
- Finding ways to control the risks (deciding what needs to be done about the problem).

11. Emergency plans

Prepare an emergency plan for the workplace that includes:

- emergency procedures
- testing of the emergency procedures
- Information, training and instructions to relevant workers in relation to carrying out the emergency procedures.

4. FACTORIES ACT

The object of the Factories Act is to regulate the conditions of work in manufacturing establishments coming within the definition of the term "factory" as used in the Act.

The first Act, in India, relating to the subject was passed in 1881.

According to the [Factories Act, 1948](#), a 'factory' means "any premises including the precincts

thereof - (i) whereon ten or more workers are working, or were working on any

day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power, or is ordinarily so carried on, or (ii) whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on; but this does not include a mine subject to the operation of the [Mines Act, 1952](#) , or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant or eating place."

The Act is administered by the [Ministry of Labor and Employment](#) through its [Directorate General Factory Advice Service & Labor Institutes \(DGFASLI\)](#) and by the State Governments through their factory inspectorates. DGFASLI was set up with the objective of advising the Central and State Governments on administration of the Factories Act and coordinating the factory inspection services in the States. It serves as a technical arm to assist the Ministry in formulating national policies on occupational safety and health in factories and docks. It also advises factories on various problems concerning safety, health, efficiency and well-being of the persons at work places.

4.1 The important provisions of the Act are as follows:-

- No adult worker shall be required or allowed to work in a factory:- (i) for more than forty-eight hours in any week; and/ or (ii) for more than nine hours in any day.
- Where a worker works in a factory for more than nine hours in any day or for more than forty-eight hours in any week, he shall, in respect of overtime work, be entitled to wages at the rate of twice his ordinary rate of wages.
- The 'ordinary rate of wages' means the basic wages plus such allowances, including the cash equivalent of the advantage accruing through the concessional sale to workers of food grains and other articles, as the worker is for the time being entitled to, but does not include a bonus and wages for overtime work.

- Where a worker is deprived of any of the weekly holidays, he shall be allowed, within the month in which the holidays were due to him or within the two months immediately following that month, compensatory holidays of equal number to the holidays so lost.
- The periods of work of adult workers in a factory each day shall be so fixed that no period shall exceed five hours and that no worker shall work for more than five hours before he has had an interval for rest of at least half an hour.
- Every worker who has worked for a period of 240 days or more in a factory during a calendar year shall be allowed during the subsequent calendar year, leave with wages for a number of days calculated at the rate of - (i) if an adult, one day for every twenty days of work performed by him during the previous calendar year (ii) if a child, one day for every fifteen days of work formed by him during the previous calendar year. In the case of a female worker, maternity leave for any number of days not exceeding twelve weeks.

4.2 In order to safeguard the health of the workers:-

- Every factory shall be kept clean and free from effluvia arising from any drain, privy or other nuisance and in particular accumulations of dirt.
- Effective arrangements shall be made in every factory for the treatment of wastes and effluents due to the manufacturing process carried on therein, so as to render them innocuous and for their disposal.
- Effective and suitable provision shall be made in every factory for securing and maintaining in every workroom adequate ventilation by the circulation of fresh air; and such a temperature that will secure to workers reasonable conditions of comfort and prevent injury to health.

- No room in any factory shall be overcrowded to an extent injurious to the health of the workers employed therein.
- Every part of a factory, where workers are working or passing, shall be provided with sufficient and suitable lighting, natural or artificial, or both.
- In every factory effective arrangements shall be made to provide, at suitable points conveniently situated for all workers employed therein, a sufficient supply of wholesome drinking water.

4.3 In order to ensure safety of the workers:-

- Every dangerous part of any machinery shall be securely fenced and constantly maintained to keep it in position.
- No young person shall be required or allowed to work at any dangerous machine unless he has been fully instructed as to the dangers arising from it and the precautions to be observed as well as has received sufficient training in work at the machine.
- No woman or child shall be employed in any part of a factory for pressing cotton in which a cotton-opener is at work (subject to the given conditions).
- In every factory every hoist and lift shall be - (i) of good mechanical construction, sound material and adequate strength; (ii) properly maintained, and thoroughly examined by a competent person at least once in every period of six months.
- No person shall be required or allowed to enter any chamber, tank, vat, pit, pipe, flue or other confined space in any factory in which any gas, fume, vapour or dust is likely to be present to such an extent as to involve risk to the workers, unless it is provided with a manhole of adequate size or other effective means of egress.

4.4 Certain facilities to be provided to the workers:-

- Every factory shall provide and maintain readily accessible first-aid boxes or cupboards equipped with the prescribed contents, and the number of such boxes or cupboards shall not be less than one for every one hundred and fifty workers ordinarily employed at any one time in the factory.
- In any factory wherein more than two hundred and fifty workers are ordinarily employed, a canteen or canteens shall be provided and maintained by the occupier for the use of the workers.
- In every factory wherein more than one hundred and fifty workers are ordinarily employed, adequate and suitable shelters, rest rooms and lunch room, with provision for drinking water, where workers can eat meals brought by them, shall be provided and maintained for the use of the workers.
- In every factory wherein more than thirty women workers are ordinarily employed, there shall be a suitable room or rooms for the use of children under the age of six years of such women. Such rooms shall provide adequate accommodation, lighting and ventilation with clean and sanitary condition.

The Factories Act empowers the State Government to appoint Inspectors, Chief Inspectors of Factories, Additional Chief Inspectors, Joint Chief Inspectors and Deputy Chief Inspectors. Every District

Magistrate is an Inspector for his district. No person can act as an Inspector if he is or becomes directly or indirectly interested in a factory or in any process or business carried on therein or in any patent or machinery connected therewith. .

Powers of Inspectors.

(a) enter, with such assistants, being persons in the service of the Government or any local or other public authority, as he thinks fit, and place which is used, or which he has reason to believe is used, as a. factory ;

- (b) Make examination of the premises, plant and machinery;
- (c) Require the production of any prescribed register and any other document relating to the factory, and take on the spot or otherwise statements of any person which he may consider necessary for carrying out the purposes of the Act; and .
- (d) Exercise such other powers as may be prescribed for carrying out the purposes of this Act. No person shall be compelled under this section to answer any question or give any evidence tending to incriminate himself.

Under Section 91, an Inspector may take a sample of any *substance*, used or Intended to be used in a factory, for the purpose of finding out whether the substance is injurious and if the factory is violating any of the provisions of the Act.